Dec. 4, 1928.

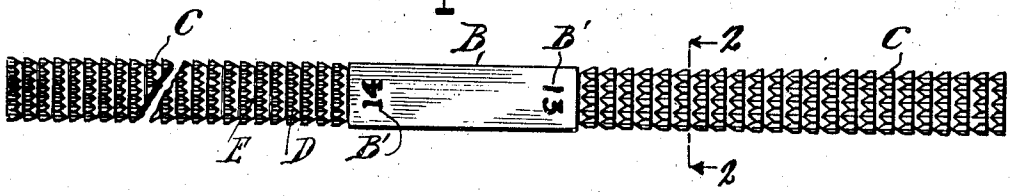
1,694,229

J. P. NESTOR

THREAD RESTORER

Filed April 22, 1927

Fig. 1.



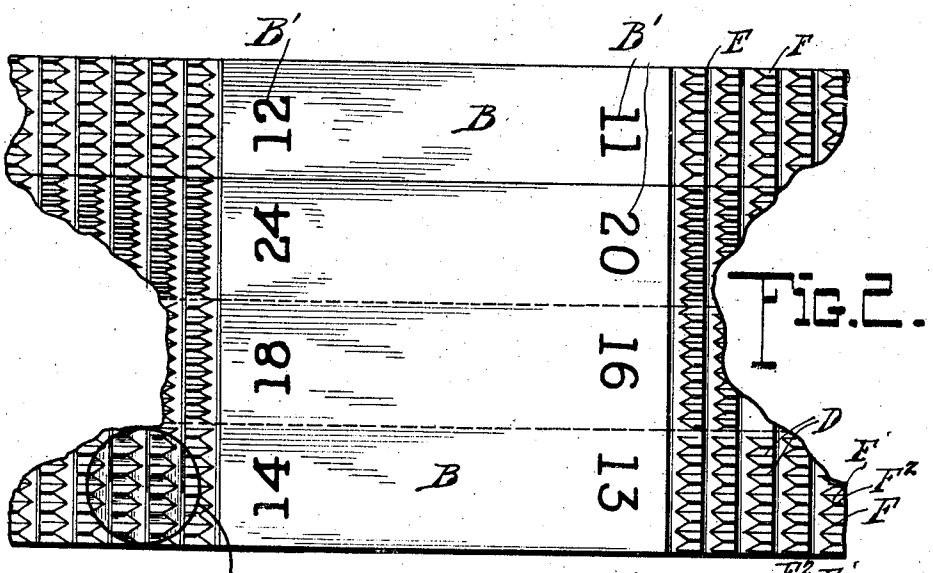


Fig. 2.

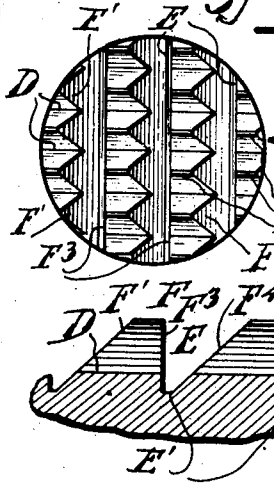


Fig. 3.

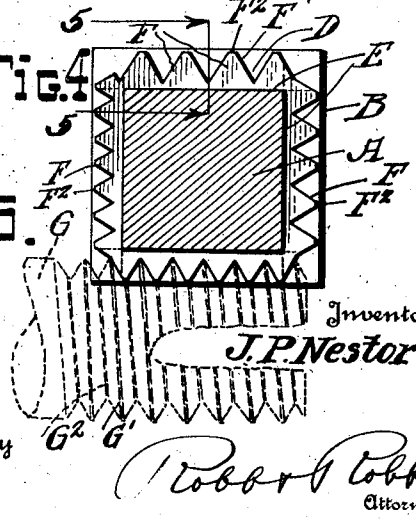


Fig. 4.

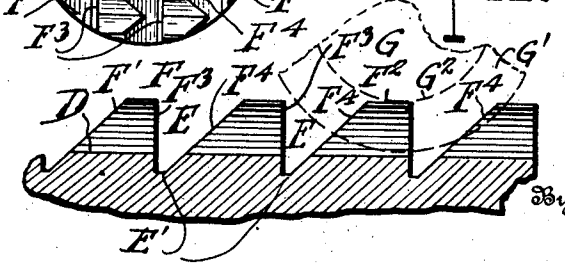


Fig. 5.

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Patented Dec. 4, 1928. 1,694,229

UNITED STATES PATENT OFFICE.

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THREAD RESTORER.

Application filed April 22, 1927. Serial No. 185,787.

This invention relates to a thread restorer, and particularly to a construction having a plurality of cutting faces of different thread pitch disposed to recondition worn or damaged threads upon bolts, shafts, screws or other threaded devices.

In devices of this character it is important to limit the depth of cut upon the thread treated to establish or restore the desired accuracy thereof according to an established gauge or standard. If the restoring tool is formed so as to file or cut at the base of the thread treated there is a liability of distorting the pitch thereof or changing its inclination through deepening the groove between intermediate threads.

It has also been found essential in the use of a filing device of this type to maintain a clearance space transversely of the threads of the file to permit the collection and discharge of particles of metal removed from the bolt treated, as otherwise the collection of such material in the groove between the threads tends to clog the file in its action thereon.

To obviate these objections and accomplish materially improved results in the operation of the thread restorer, each of the filing faces thereof is formed with a series of longitudinal channels leaving intermediate teeth spaced to correspond to the pitch or gauge of the thread to be recut, and such teeth are sub-divided into small angular sections by a plurality of transverse grooves thus forming a cutting member with faces inclined downwardly in opposite directions and also with a cutting face in a substantially vertical plane and at the opposite side with a downwardly inclined face merging into a flat portion at the base of a transverse groove. The apex of the downwardly inclined faces is flattened or smoothed at the top so as to avoid any cutting action at the base of the bolt thread and the tooth has a cutting face of such area as to limit the degree of cut of the file necessary in maintaining or restoring the proper pitch of the thread to be restored. This is accomplished by the engagement of such flat face with the base of the groove intermediate the threads of the bolt which positively determines the depth of cut possible and assures an accuracy of result which could not be secured were there any cutting action at the base of the screw thread. The transverse grooves are of greater depth than the area of cut upon the article treated and thus form clearance spaces for the separated metal disposed at a point removed from the operative area of the tooth of the restorer.

The invention has for an object to provide a novel and improved construction of thread restoring tool comprising a body having a file face formed with longitudinal channels spaced to conform to the pitch of the thread to be restored and intersecting transverse grooves which produce teeth members each having oppositely inclined upper faces with a vertical cutting face and a downwardly inclined face at the opposite side of the tooth communicating with the transverse groove.

A further object of the invention is to form the tooth with a substantially vertical cutting face and a rear wall extending downwardly and communicating with a transverse groove disposed beneath the operative area of such cutting face so as to collect material falling therefrom and prevent it from clogging either the file or collecting upon the cutting surface.

Another object of the invention is to form the file with a plurality of faces each of different thread pitch and formed with longitudinally extending channels spaced to conform to such pitch and intersect it by transverse grooves which produce teeth having downwardly inclined side walls while the apex of such walls is removed and smoothed to provide a flat surface which will prevent cutting at the base of the thread being treated.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claim.

In the accompanying drawing:—

Figure 1 is a plan of the invention;

Figure 2 is a diagrammatic illustration of four faces thereof constructed to restore threads of different gauge or pitch;

Figure 3 is an enlarged detail within the circle indicated at 3 in Figure 2;

Figure 4 is an enlarged section on the line 2—2 of Figure 1; and

Figure 5 is a similar view on the line 5—5 of Figure 4.

Like reference characters designate corresponding parts throughout the several figures of the drawing.

In the application of the invention any desired number of file or cutting faces may be

provided and the pitch or gauge of the thread thereof formed to correspond to existing standards of thread in common use, such as the U. S. Standard or Briggs' Standard threads. As showing one application of the invention, I have provided in Figure 1 a rectangular body A from which the restorer is formed and this provides for four faces at each side or end of the central smooth hand hold B, thus giving eight different thread cutting faces which are suitably designated upon the portion B, for instance by the numerals as at B'. These end portions indicated generally by the numeral C comprise cutters or files and are formed with a plurality of longitudinal grooves D spaced from each other to correspond with the particular pitch or gauge of the thread to be restored by a face of the device. In the form shown these only differ in the degree of pitch so that one will be specifically described.

The file face is formed with a series of transverse grooves E which intersect the longitudinal grooves D and are of greater depth so as to provide a clearance space E' at their base. The transverse grooves may be at any desired angle to the longitudinal grooves. The result of the longitudinal and transverse grooves is to produce an angular tooth as indicated at F which is formed with oppositely downwardly inclined faces F' the apex of which is removed at F^2 to form a flat or smooth face which will seat against the base of the groove intermediate the threads of the article being treated, for instance the bolt G as shown in Figures 4 and 5. In this illustration of operation the thread G' lies within the cutting area of the tooth while the base G^2 of the groove intermediate such thread contacts with the flat face F^2 as in Figure 5.

The front or cutting face F^3 of the tooth produced is substantially vertical and extends downward to the base E' of the transverse groove which is below the operative area of such face, while the rear wall of the tooth is inclined downwardly at F^4 and merges into the clearance space at E'. Again referring to Figure 5, it will be seen that during the operation of the file or cutter the thread G' being treated always lies above this clearance space and metal removed therefrom therefore falls clear of the cutting face of the tooth and also the thread being treated.

The operation of the tool will be apparent from the foregoing description from which it will be understood that it is applied to the article treated by a reciprocatory motion in the direction of the length of the threads and may be given a slightly curved movement to correspond to the circumference thereof and secure an even cutting action without any tendency to flatten. In this movement the face of the cutting tooth continues to operate upon the thread until it seats in a space intermediate thereof which limits its degree of action and therefore assures absolute accuracy in the pitch or gage of the thread to the standard for which the tool is formed. During such filing any material removed from the thread is caught by the clearance space and any tendency of the tool to clog the teeth thereof is entirely removed. This is of particular importance when the tool is used to remove rust or dirt clogged in threads which have not been used for considerable periods.

It is therefore apparent that the invention may be used not only for the purpose of restoring worn or damaged threads but also for properly conditioning threads which have become corroded or rusted so as to permit the easy operation of a nut thereon.

While the invention is shown as providing four separate threading surfaces, they may be increased or reduced at will, and likewise the cross section of the bar may be formed as found most convenient. The particular form of the cutting face of the tool may be also altered or changed without departing from the spirit of the invention as defined by the appended claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

A thread restorer comprising a body having a file face formed with longitudinal channels spaced to conform to the pitch of a thread to be restored and intersecting transverse grooves of greater depth than the longitudinal grooves, thereby producing separated teeth members the apex of each of which is flattened longitudinally of the body to prevent cutting action and the lower operative portion of each cutting face being disposed above the base of the transverse groove and at the level of the longitudinal channel to provide a clearance space.

In testimony whereof I affix my signature.

JOSEPH P. NESTOR.